

Beacon Manufacturers Workshop

Annapolis, Maryland

May 1st 2014



Cospas-Sarsat Programme Updates

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Cospas-Sarsat Secretariat



Cospas-Sarsat Programme

Cospas-Sarsat Programme Status

- Mission Statement
- Programme Participants
- Search and Rescue using beacons evolution: A Cospas-Sarsat Perspective
- System segments Status: Space, Ground, Beacon
- Assisted Saves statistics

Cospas-Sarsat Programme Evolution

- MEOSAR System Concept
- MEOSAR Status, Timeline and deployment schedule

Other Cospas-Sarsat Programme matters

- New Cospas-Sarsat Website
- IBRD updates





Cospas-Sarsat Mission

Mission Statement

The International Cospas-Sarsat Programme provides accurate, timely and reliable distress alert and location data to help search and rescue authorities assist persons in distress.

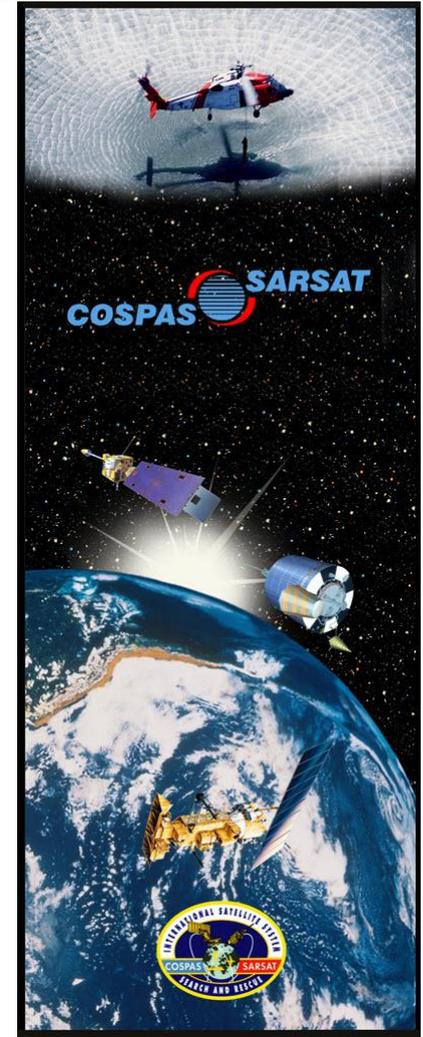
Objective

The objective of the Cospas-Sarsat system is to reduce, as far as possible, delays in the provision of distress alerts to SAR services, and the time required to locate a distress and provide assistance, which have a direct impact on the probability of survival of the person in distress at sea or on land.

Strategy

Cospas-Sarsat Participants implement, maintain, co-ordinate and operate a satellite system capable of detecting distress alert transmission from radiobeacons and of determining their position anywhere on the globe. The distress alert and location data is provided by Cospas-Sarsat Participants to the responsible SAR services.

Services are provided world-wide and free of charge for the user in distress.





Cospas-Sarsat Participants

Cospas-Sarsat Participants



4 Founders: Canada, France, Russia and the USA

26 Ground Segment Providers

11 User States

2 Organisations

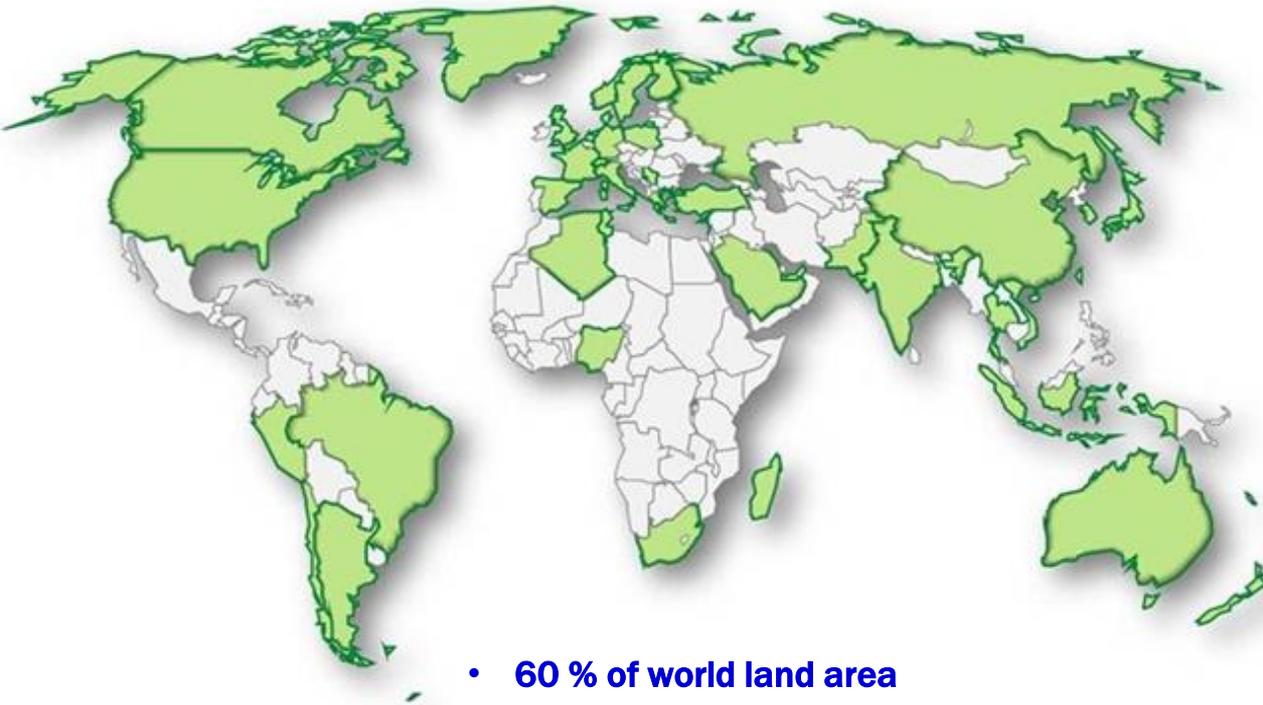
- Algeria
- Argentina
- Australia
- Brazil
- Canada
- Chile
- China (P.R.)
- Cyprus
- Denmark
- Finland
- France
- Germany
- Greece
- Hong Kong
- India
- Indonesia
- Italy
- ITDC
- Japan
- Korea (R. of)
- Madagascar
- Netherlands
- New Zealand
- Nigeria
- Norway
- Pakistan
- Peru
- Poland
- Russia
- Saudi Arabia
- Serbia
- Singapore
- South Africa
- Spain
- Sweden
- Switzerland
- Thailand
- Tunisia
- Turkey
- UAE
- UK
- USA
- Vietnam





Cospas-Sarsat Participants

Cospas-Sarsat Participants



- 60 % of world land area
- 72 % of world population
- 84 % of estimated world wealth

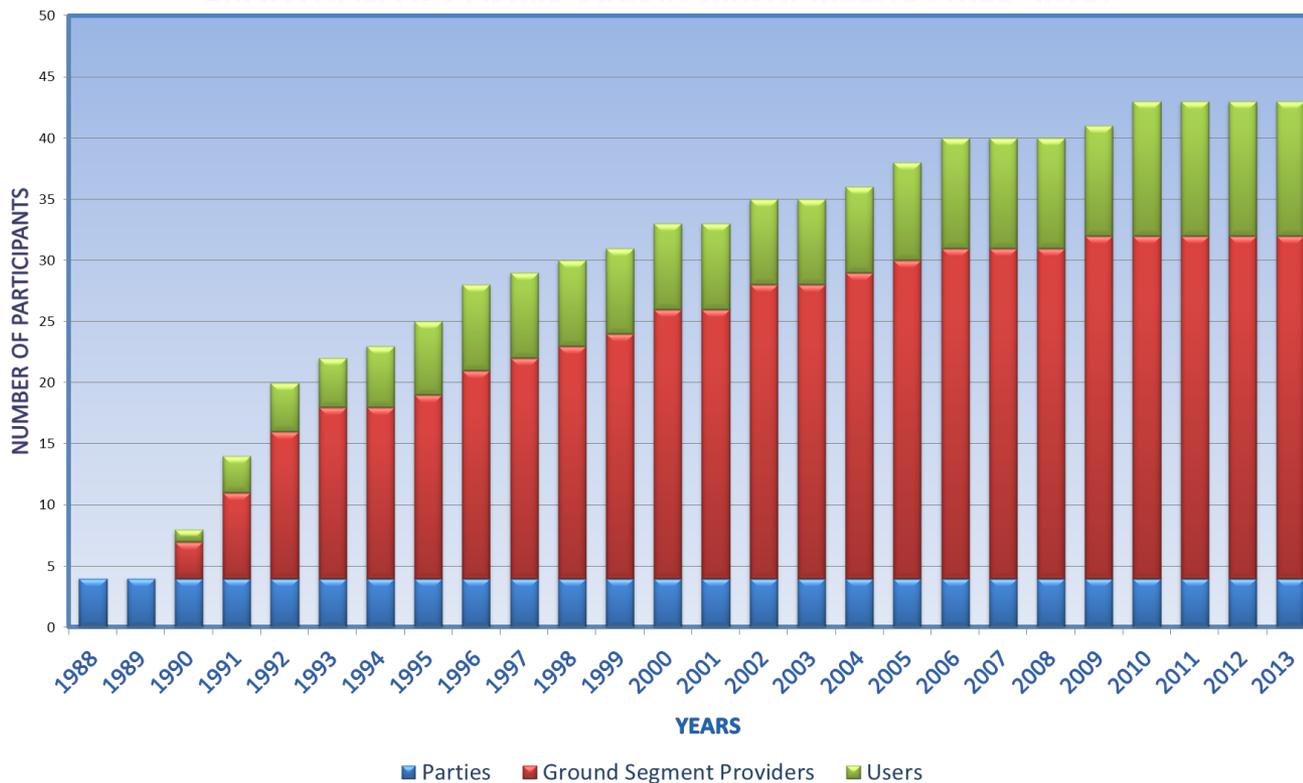
- | | |
|---------------|--------------|
| Algeria | Netherlands |
| Argentina | New Zealand |
| Australia | Nigeria |
| Brazil | Norway |
| Canada | Pakistan |
| Chile | Peru |
| China (P.R.) | Poland |
| Cyprus | Russia |
| Denmark | Saudi Arabia |
| Finland | Serbia |
| France | Singapore |
| Germany | South Africa |
| Greece | Spain |
| Hong Kong | Sweden |
| India | Switzerland |
| Indonesia | Thailand |
| Italy | Tunisia |
| ITDC | Turkey |
| Japan | UAE |
| Korea (R. of) | UK |
| Madagascar | USA |
| | Vietnam |





Cospas-Sarsat Participants

EVOLUTION OF COSPAS-SARSAT PARTICIPANTS (1988-2013)



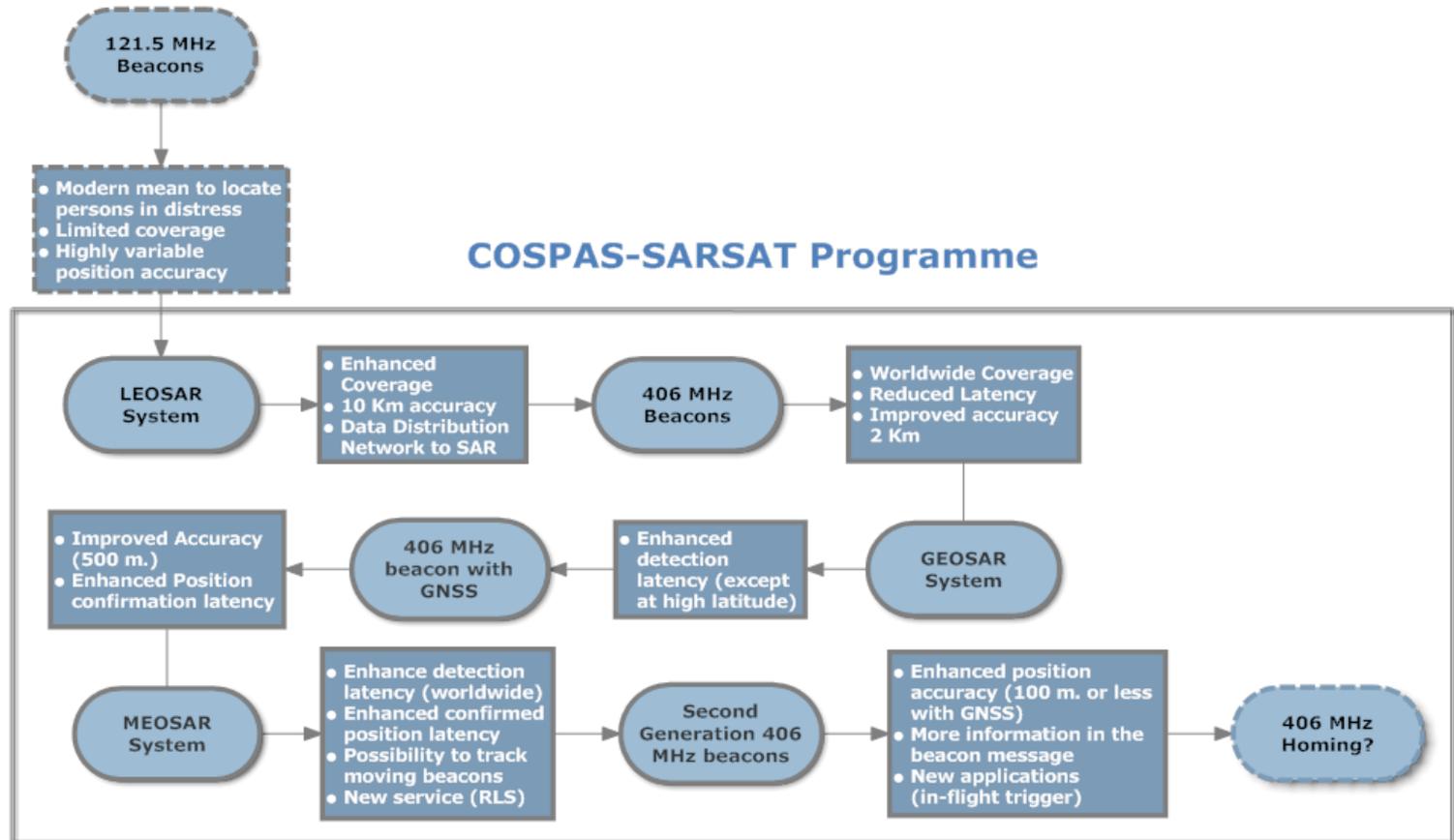
**41 States and
2 Organisations:**

- **4 Parties:**
Canada, France,
Russia, USA
- **28 Ground
Segment
Providers**
- **11 User States**





Search and Rescue using beacons evolution: A Cospas-Sarsat Perspective

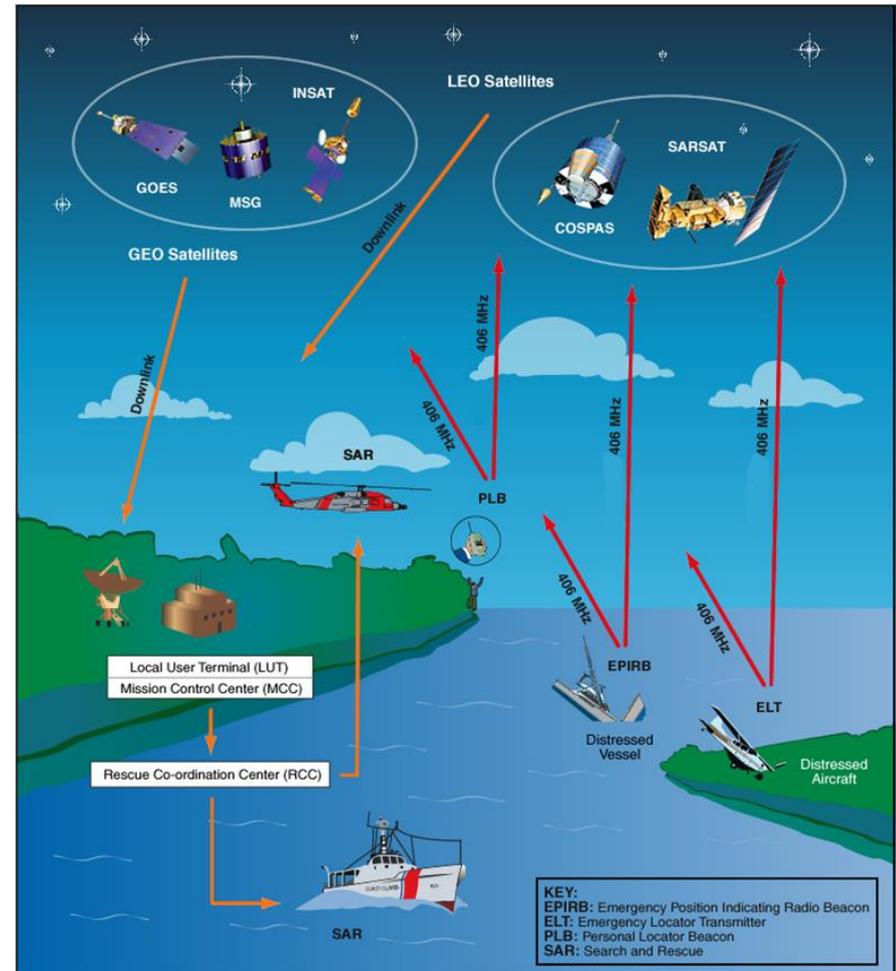




Space Segment

2 Types of Operational Satellites

- Low Earth Orbiting Search And Rescue (LEOSAR)
- Geostationary Orbiting Search And Rescue (GEOSAR)





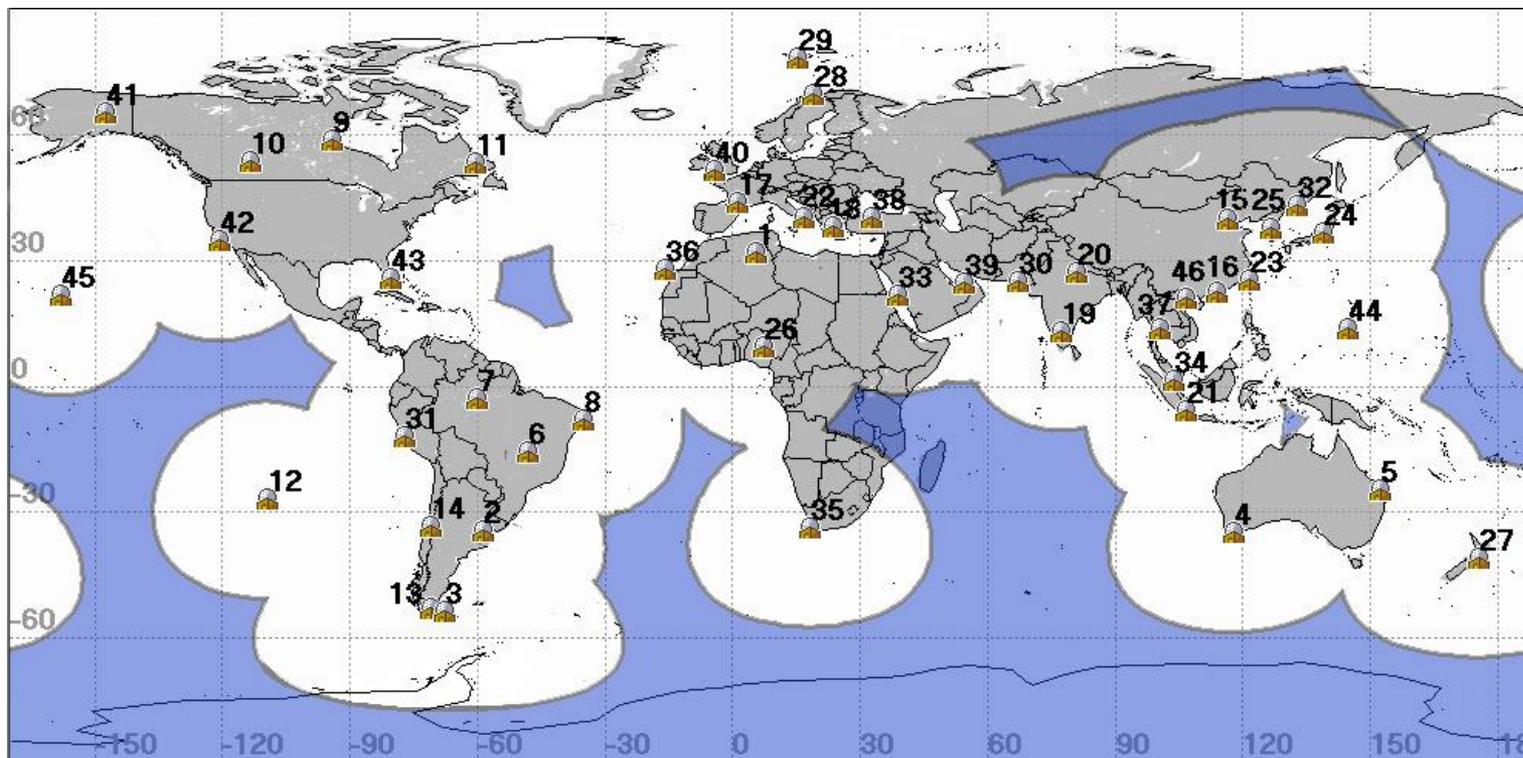
Cospas-Sarsat Components

- **Space Segment:**
 - 6 LEO satellites (3 more still planned to be deployed)
 - 6 GEO satellites + 2 more recently completed commissioning tests (5 more planned before 2018)
- **Ground Segment:**
 - 54 Operational LEOLUTs + 1 in development
 - 22 Operational GEOLUTs + 1 in development
 - 30 Operational Mission Control Centres + 1 in development
- **Distress Beacons:**
 - >1.4 million 406 MHz beacons (end of 2013)
 - about 40 active manufacturers





LEO System Visibility



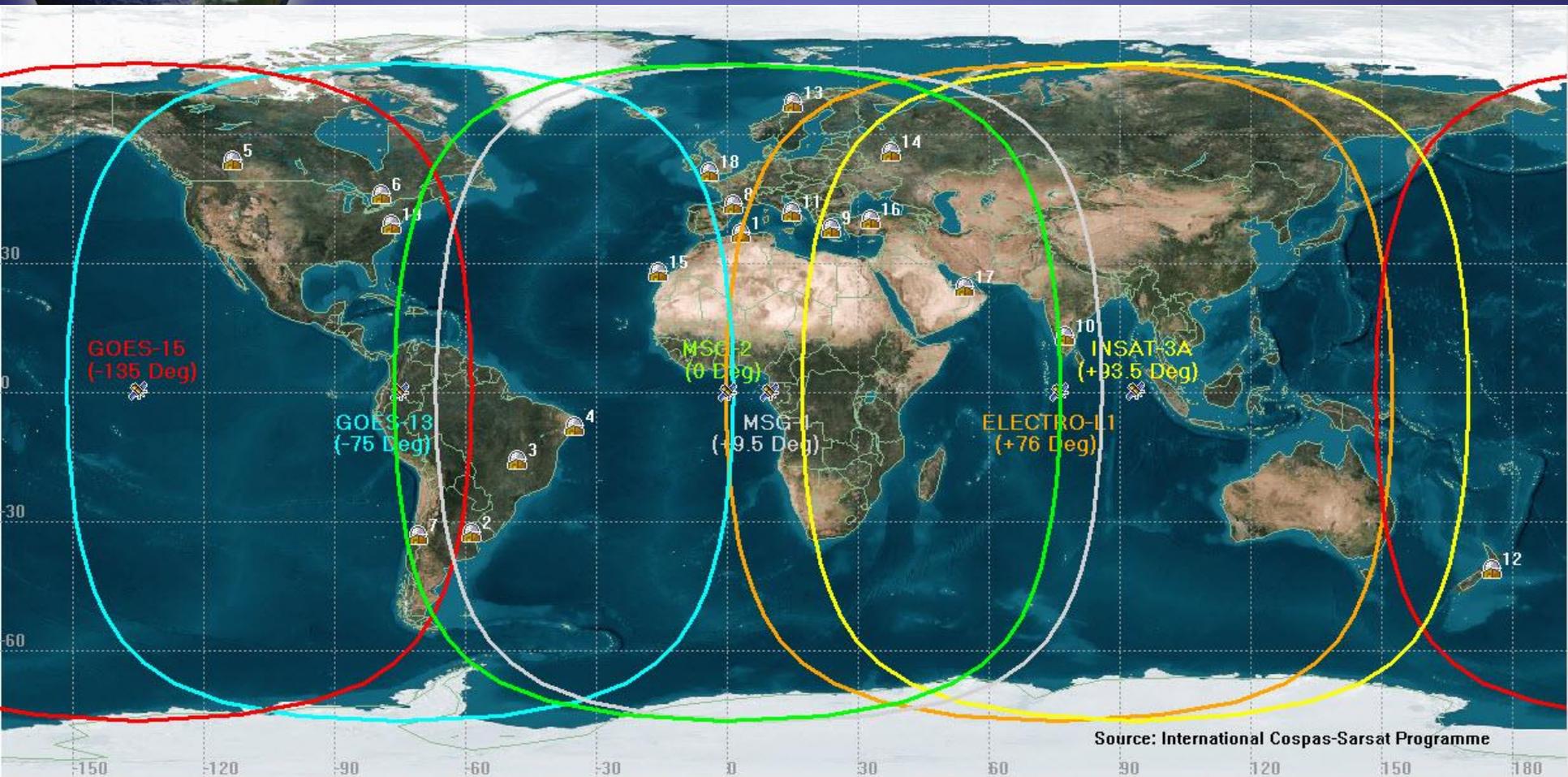
LEOSAR SAR Visibility (end of 2013)





Space Segment: GEOSAR Coverage

As of April 2014



- 1 satellite visibility 96.1%
- 3 satellites visibility 38.5%

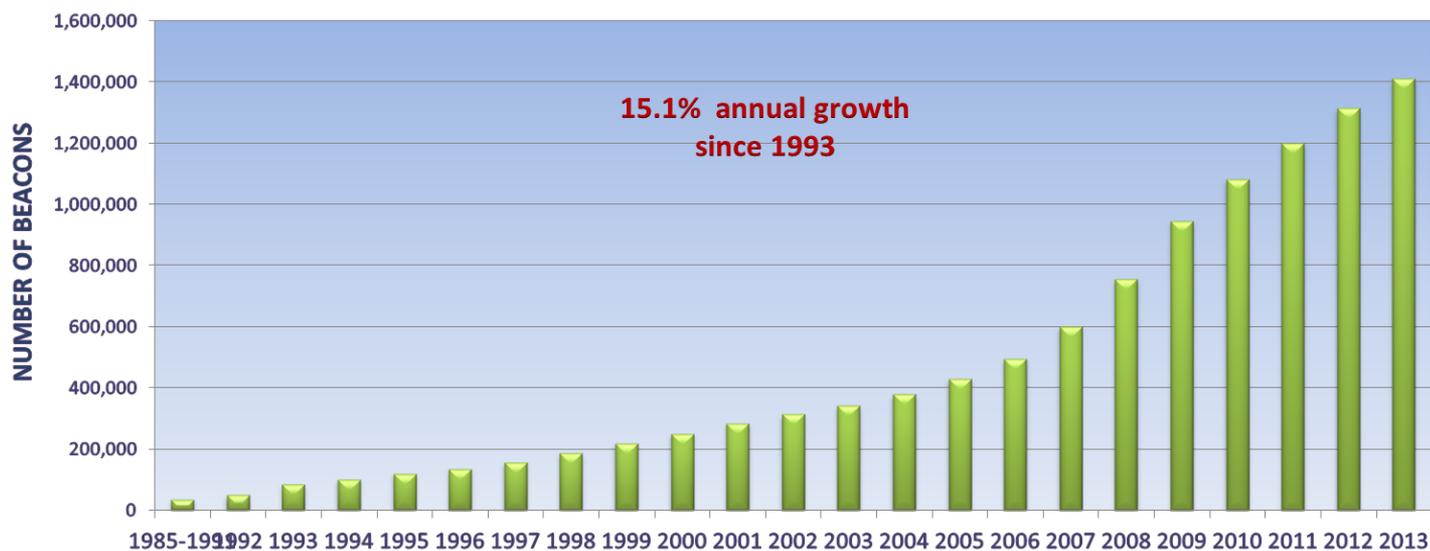
- 2 satellites visibility 80.9%
- 4 satellites visibility 15.3%



Beacon Population Evolution



406 MHZ BEACON POPULATION



■ ESTIMATED NO. IN USE

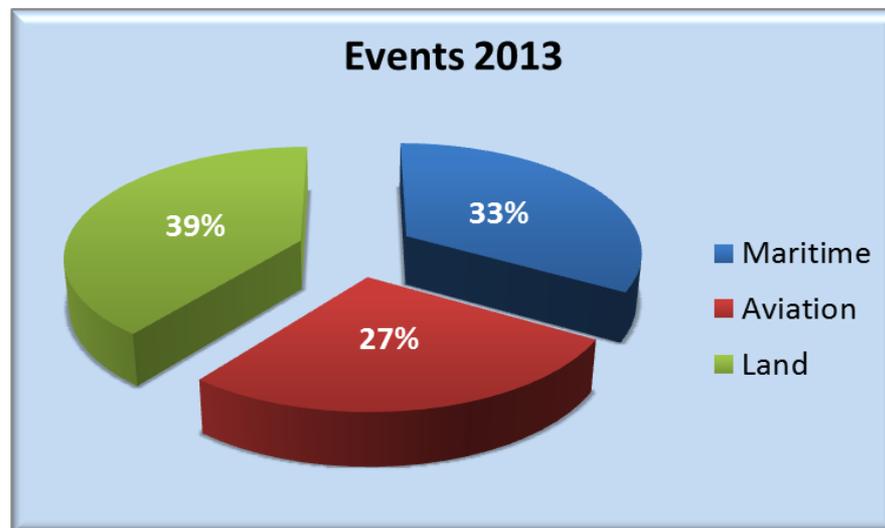


Cospas-Sarsat SAR Events and Assisted Saves

Worldwide Results

2013 (Partial)
SAR Events: **741 (TBC.)**
P. Rescued: **1931 (TBC.)**

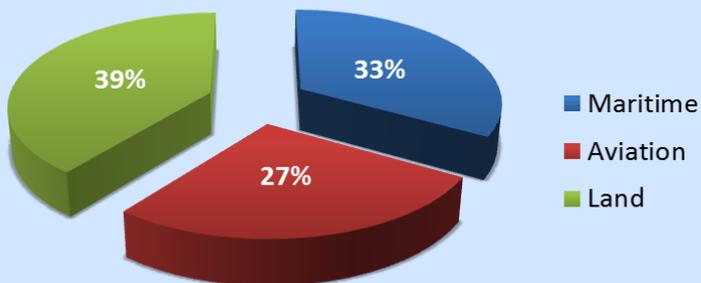
SAR Events (1982 / 2013) : **> 10382**
P. Rescued (1982 / 2013) : **> 36,986**



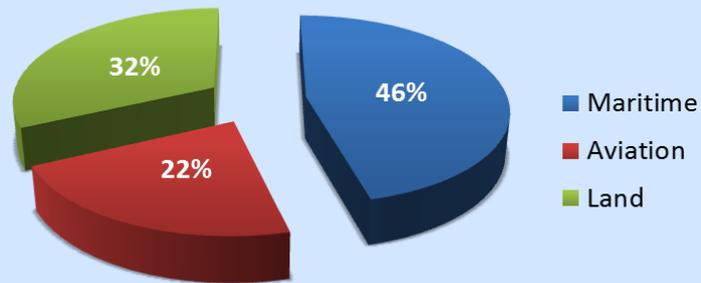


Cospas-Sarsat SAR Events and Assisted Saves

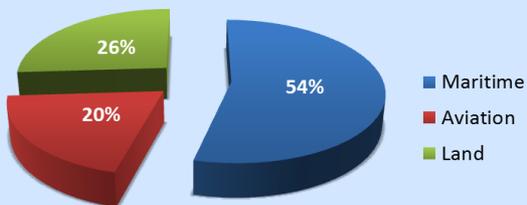
Cospas-Sarsat Events 2013



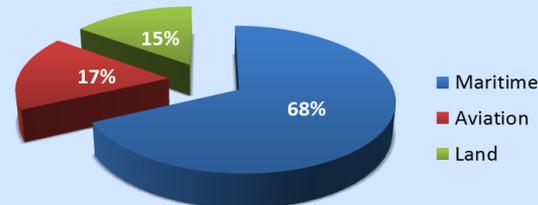
Cospas-Sarsat Assisted Saves 2013



Cospas-Sarsat Events 2012



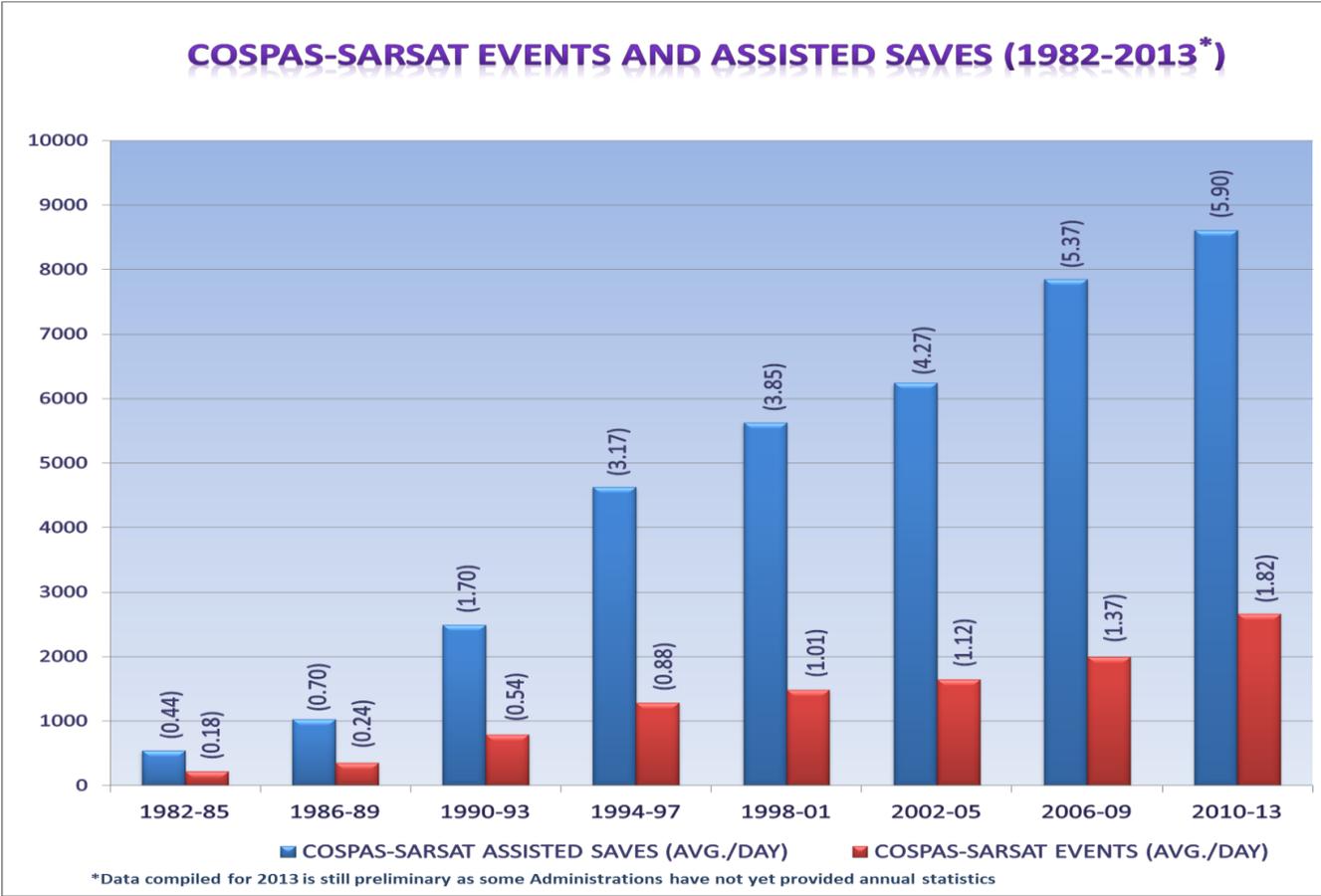
Cospas-Sarsat Assisted Saves 2012





Cospas-Sarsat Saves Evolution

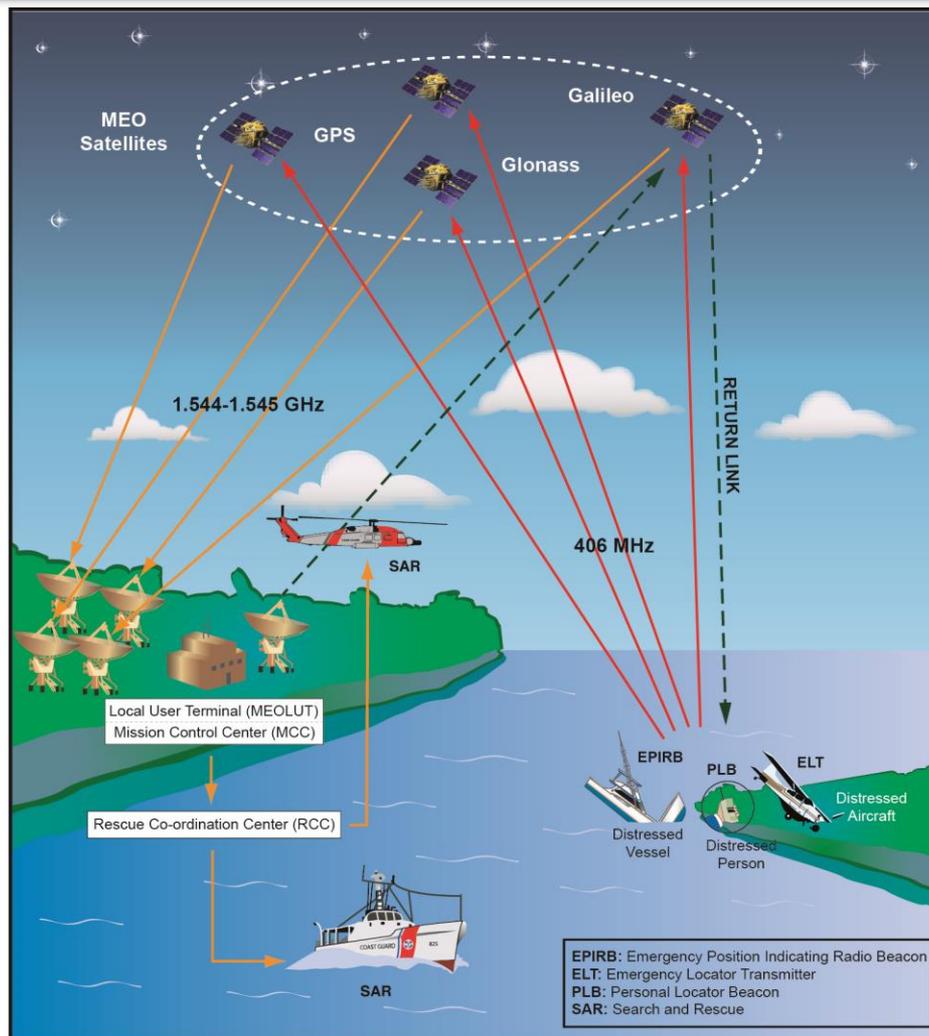
COSPAS-SARSAT EVENTS AND ASSISTED SAVES (1982-2013*)



ON AVERAGE 5.9 ASSISTED RESCUES PER DAY IN THE LAST 4 YEARS



MEOSAR System Concept





MEOSAR System Concept

Russia (GLONASS), USA (GPS) and EC (Galileo) will provide 406 MHz repeater instruments on future medium Earth altitude orbiting (MEO) satellite constellations

- Backward compatible with current 406MHz beacons
- SAR components of constellations will be fully interoperable
- Operational alerts could be made available in the Cospas-Sarsat System as soon as 2014



Why MEOSAR ?

- Improve speed and reliability of detecting and locating 406 MHz distress alerts (near-real-time):
 - Can locate beacons on single burst : First Burst Detection and Location
 - Continuous detection and location
 - Independent location accuracy improves in time
- Moving beacons can be tracked:
 - on life raft adrift at sea
 - on aircraft in emergency in flight (before a crash)
- No Doppler mirror image location generated
- Additional features e.g. Return Link Service, cancellation of false alerts
- High level of satellite redundancy and availability (multiple path less susceptible to blockage)
- Allowing improvements in beacon performance and affordability (SGB)





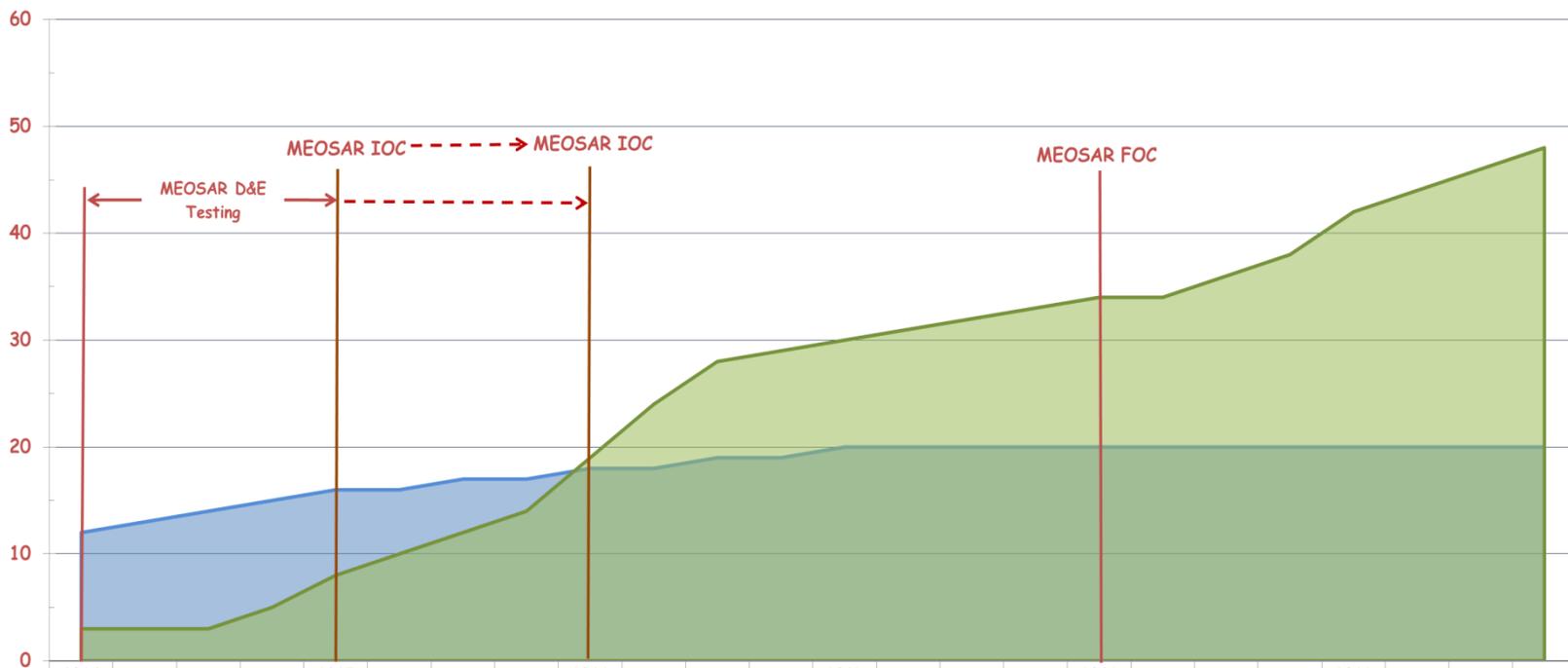
Cospas-Sarsat MEOSAR Space Segment Status

- **13 DASS POC payloads (S-Band) in orbit, used by Cospas-Sarsat Participants for MEOSAR D&E tests. Seven more payloads expected to be deployed by 2017.**
- **Three operational L-Band MEOSAR payloads are available for, one on Glonass K-1 launched in early 2011 and two on Galileo IOV satellites . A second Glonass K is expected to be deployed near the end of 2014. Six Galileo FM satellites with SAR payloads are expected to be deployed in 2014. 40+ payloads planned to be available for operational use by the of 2019.**



MEOSAR Space Segment Planned Availability

MEOSAR PAYLOADS AVAILABILITY (2014-2019)

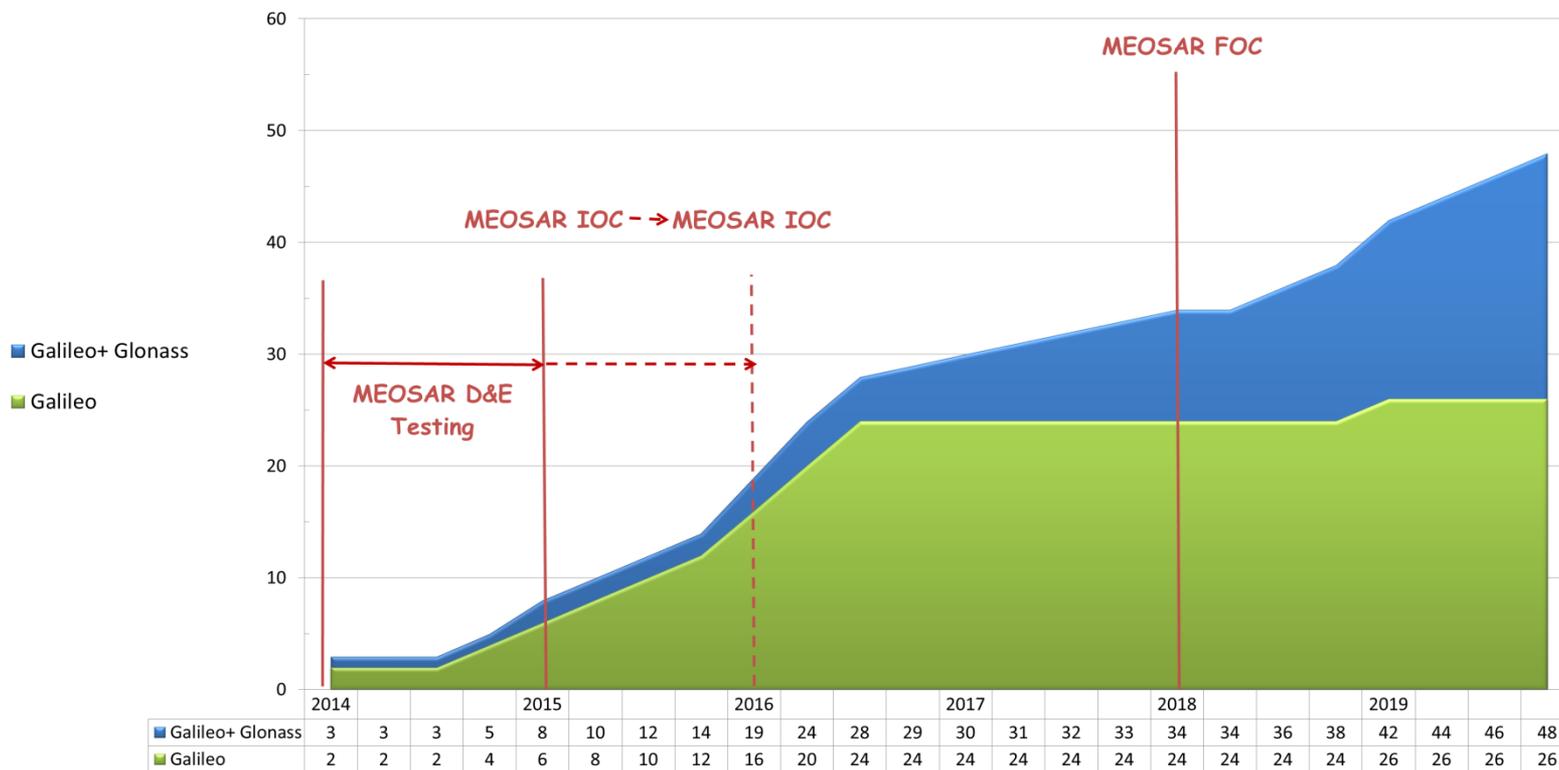


	2014			2015				2016				2017				2018			2019					
S-Band payloads (Experimental)	12	13	14	15	16	16	17	17	18	18	19	19	20	20	20	20	20	20	20	20	20	20		
L-Band payloads (Operational)	3	3	3	5	8	10	12	14	19	24	28	29	30	31	32	33	34	34	36	38	42	44	46	48





Cospas-Sarsat MEOSAR Operational Space Segment Planned Availability





Details and Status of Existing and Planned Experimental MEOLUTs

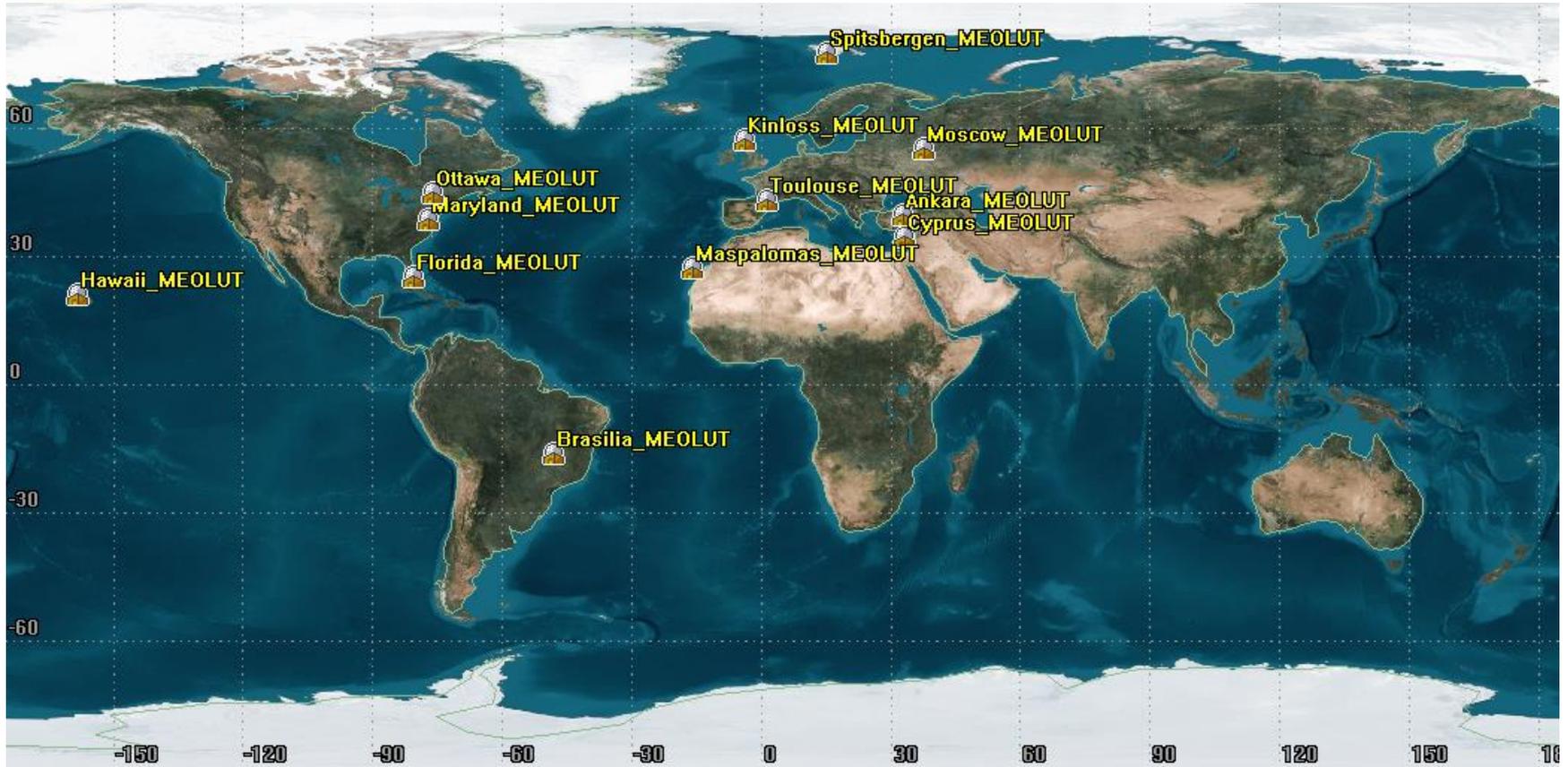
as of April 2014

Ground Segment Operator	MEOLUT Name	Code	Associated MEOSAR-ready MCC	MEOSAR-ready MCC Status	MEOLUT Location		Number of Channels	MEOLUT Status
					Latitude	Longitude		
Algeria	Reghaia	TBD	Algiers	Planned (2014)	36° 44' N	003° 20' E	4	Planned (2014)
Argentina	El Palomar	TBD	El Palomar	Planned (second half 2015)	34° 36' S	058° 36' W	4	Planned (second half 2015)
	Rio Grande	TBD			53° 46' S	067° 42' W	2	
Australia	Mingenew	5034	Canberra	Planned (2015)	29° 01.80' S	115° 12.60' E	6	Planned (2017)
Brazil	Brasilia	7106	Brasilia	Available	15° 51.43' S	047° 54.13' W	4	Available (2 additional channels in 2015)
	Recife	TBD			TBD	6	Planned (2015)	
Canada	Ottawa	TBD	Trenton	Planned (2014)	45° 21.18' N	075° 54.07' W	4	Available
China (P. R. of)	Beijing	TBD	Beijing	Planned	40° 06.23' N	116° 12.55' E	4	Planned
Cyprus	Larnaca/EU	2090	Larnaca	Planned (2014)	34° 51.81' N	033° 23.03' E	4	Available
France	Toulouse	2274	Toulouse	Available	43° 33.65' N	001° 28.85' E	4	Available
Greece	TBD	TBD	TBD	Planned	TBD	TBD	TBD	Planned
India	TBD	TBD	Bangalore	Planned	TBD	TBD	TBD	Planned
Italy	N/A	N/A	Bari	Available	N/A	N/A	N/A	N/A
Japan	Chiba	TBD	Tokyo	Available	35° 14.50' N	139° 55.25' E	4	Planned (2018)
New Zealand	Wellington	5124	Canberra	Planned (2015)	38° 31.00' S	176° 29.14' E	6	Planned (2017)
Norway	Spitsbergen/EU	2574	Bodoe	Available	78° 13.82' N	015° 22.43' E	4	Available
Pakistan	TBD	TBD	Karachi	Planned	TBD	TBD	TBD	Planned
Peru	TBD	TBD	Callao	Available	12° 01.62' S	077° 07.62' W	4	Planned
Russia	Moscow	2737	Moscow	Planned (2014)	55° 44.86' N	037° 43.38' E	1	Available (3 additional channels in 2014)
Singapore	TBD	TBD	TBD	Planned (2017)	TBD	TBD	TBD	Planned (2017)
South Africa	Cape Town	TBD	Cape Town	Planned	TBD	TBD	TBD	Planned
Spain	Maspalomas/EU	2244	Maspalomas	Available	27° 45.68' N	015° 38.09' W	4	Available
Thailand	TBD	TBD	TBD	Planned	TBD	TBD	TBD	Planned
Turkey	Ankara	2714	Ankara	Planned (2014)	40° 08.49' N	032° 59.40' E	6	Available
UAE	Abu Dhabi	4703	Abu Dhabi	Planned (June 2014)	24° 26' N	054° 27' E	4	Planned (June 2014)
UK	Kinloss	2324	Kinloss	Planned (end of 2014)	57° 39.48' N	003° 33.51' W	2	Available
USA	Hawaii	3385	Suitland	Available	21° 31.47' N	158° 00.07' W	6	Available
	Maryland	3677			38° 59.94' N	076° 51.26' W	4	Available
	Miami	3669			25° 37' N	080° 23' W	6	Planned (2014)



Existing Experimental MEOLUTs

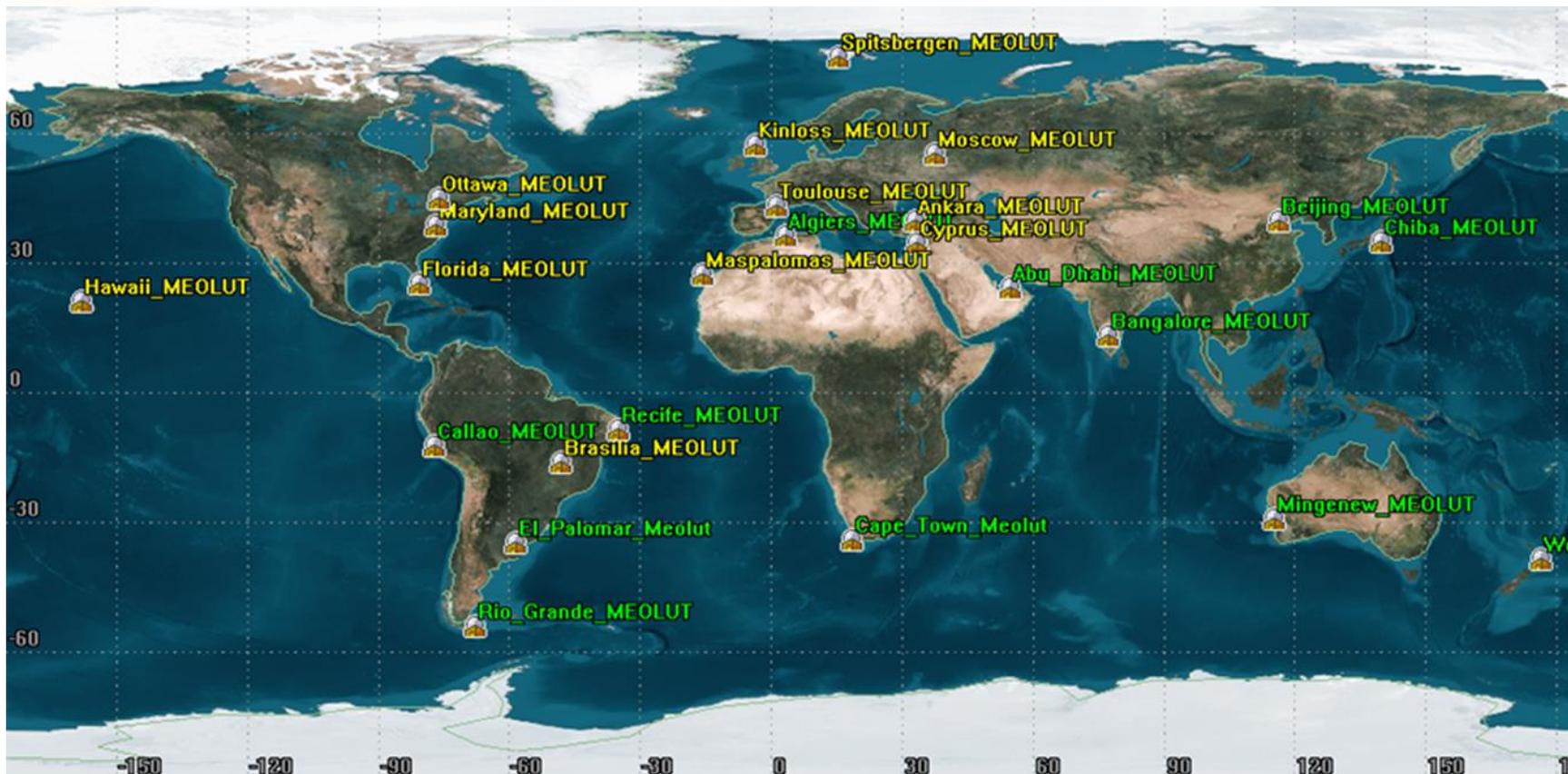
as of April 2014





Existing + Planned Experimental MEOLUTs

as of April 2014





Cospas-Sarsat MEOSAR Timeline

- Cospas-Sarsat MEOSAR schedule will be reviewed in more detail in the upcoming months
- Success oriented timeline for most important events are currently planned as follow:
 - End of MEOSAR D&E (2015)
 - MEOSAR IOC (2015)
 - MEOSAR FOC (beginning of 2018)
 - Second Generation Beacons available on the market (end of 2018)



Important Cospas-Sarsat and 406 MHz Beacon Related Activities since September 2013

- First Eurocae WG-98 meeting (November 2013). The group is expected to provide a draft revision to ED-62A Minimum Operational Performance Specification for Aircraft Emergency Locator Transmitters, in particular, to address future SGB and ELT triggered-in-flight requirements
- Cospas-Sarsat Task Group meeting on SGB specification (February 2014)
- Cospas-Sarsat Task Group meeting on MEOSAR D&E Phase (March 2014)
- ITU WP-4C meetings on the protection of the Cospas-Sarsat system from out-of-band/adjacent band emissions of other services (two WP-4C meetings in October 2013 and February 2014)
- First Eurocae WG-98 /RTCA SC-229 joint meeting (March 2014) the two groups are to develop new harmonized requirements for ELTs (ED-62 and DO-204).



Upcoming Cospas-Sarsat and 406 MHz beacon related meetings in 2014

- Cospas-Sarsat JC-28 meeting (June 2014)
- Last ITU 4C meeting (prior to WRC 15 CPM) on the protection of the Cospas-Sarsat system from out-of-band/adjacent band emissions of other services (June 2014)
- Eurocae WG-98 /RTCA SC-229 joint meetings (September and December 2014)
- Cospas-Sarsat Expert Working Group Meeting on MEOSAR D&E (September 2014)



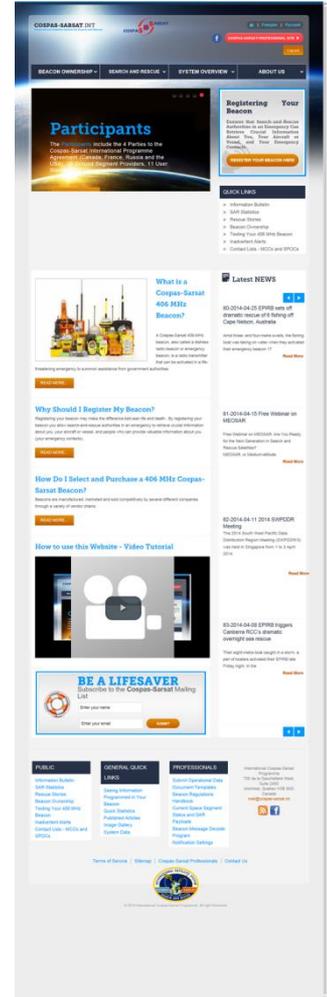
New Cospas-Sarsat Website

- New Cospas-Sarsat website inaugurated on 27 March 2014 (UTC), with most but not all work completed
- Enhanced functionality available throughout the website, in particular, mobile-platform-friendly design that incorporates automatic scaling to the screen of the device from which the website is accessed
- Engineered as two available “mini-sites”, with one directed towards the general “public” audience (beacon owners, prospective beacon owners and those previously unfamiliar with the Programme) and the other towards Cospas-Sarsat “professionals” who need quick access to documents and tools
- Menu reorganized with the addition of customized icons and quick links, to permit the user to easily and intuitively locate information relevant to them throughout the site



New Cospas-Sarsat Website

- Consolidation of duplicative tables and the addition of customized filters that facilitate quickly finding the desired information within tables
- Recoding of the website backend, elimination of obsolete articles, clean-up of QMS tables and select database tables to reduce overall site latency, thus improving user access times to load site pages
- Framework where the Secretariat can more easily manage content on the website (in three languages) and develop future modules at relatively low costs
- Long-term cost savings to be realized with the new system architecture





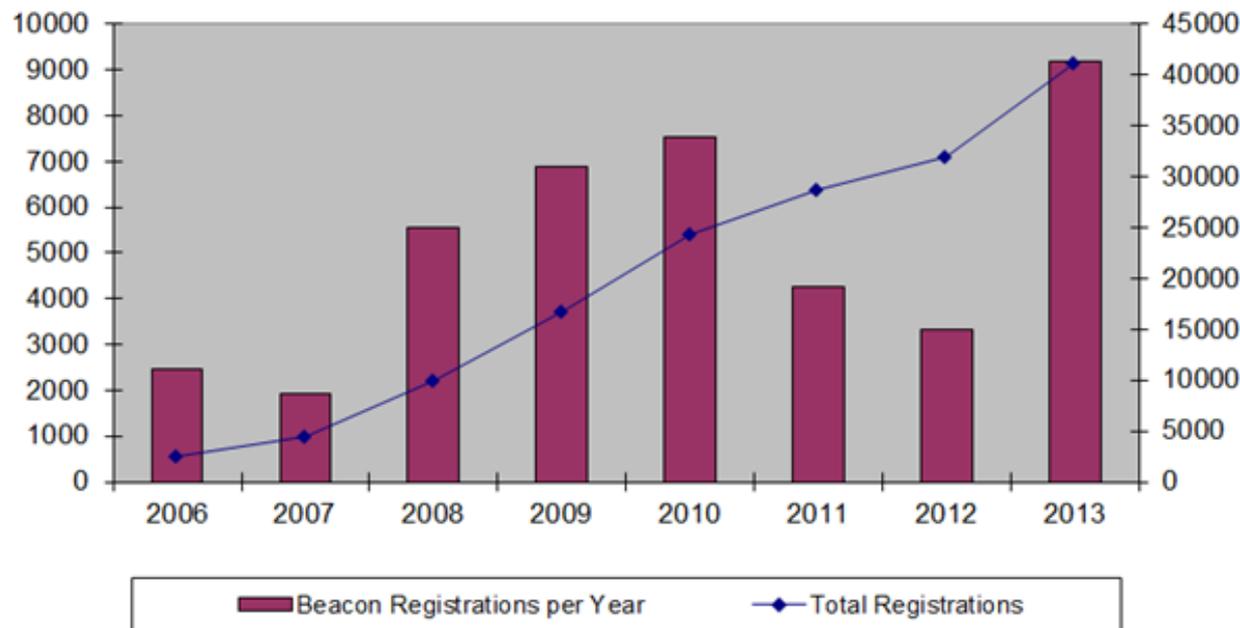
International Beacon Registration Database (IBRD)

- Cospas-Sarsat operates the International 406 MHz Beacon Registration Database (IBRD) which is freely available to users with beacons coded to a country with no national registration facilities, or with beacons coded to an Administration that wishes to allow use of the IBRD
- IBRD helps to facilitate the availability of beacon registration data to SAR services
- The search and rescue community has continued consistent use of the IBRD, with an average of 315 SAR users per month logging in to the IBRD in 2013



International Beacon Registration Database (IBRD)

- In 2013, there were over 9,000 new beacon registrations in the IBRD, which now holds more than 41,000 registration records for beacons from 125 Administrations, of which only 15 had more than 500 beacons registered (none above 5000 beacons)





For More Information

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